

# IBS BULLETIN

FACTS FOR MUSIC SCRIPTS

NEW POLICE FOR BUSY AIR

SURVEY CODING NEARS  
COMPLETION

INTERNATIONAL PLANS  
OUTLINED

30¢ Per Copy \$2.50 Per Year

"THIS IS THE INTERCOLLEGIATE BROADCASTING SYSTEM"







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# I. B. S. BULLETIN

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## CONTENTS

| TITLE                                                           | PAGE          |
|-----------------------------------------------------------------|---------------|
| New Police for Busy Air.....                                    | 1             |
| International Plans Outlined.....                               | 2             |
| Survey Coding Nears Completion.....                             | 4             |
| Facts for Music Scripts, by F. John Pessolano, Jr.....          | 8             |
| Schedule Changes in Fall.....                                   | 12            |
| Bulletin Gets Format Change.....                                | 11            |
| Alumni Club Formed.....                                         | 7             |
| New Plan for Publications.....                                  | 6             |
| Station KBYU New IBS Member.....                                | 7             |
| IBS People Go West.....                                         | 10            |
| WBS Script Chief Wins Mademoiselle Award.....                   | 10            |
| Wesleyan Station Reconverts.....                                | 10            |
| Booklet to Expound Station Mysteries for Columbia.....          | 10            |
| KTX Manager in Town.....                                        | 7             |
| New Calls.....                                                  | 11            |
| Study of Rates.....                                             | 11            |
| Intermodulation Distortion.....                                 | 19            |
| Reducing Transmitter Hum and Radiation of Harmonics.....        | 20            |
| Converting F-M Receivers for Use on the New 88-108 Mc Band..... | 21            |
| A Note on the Power Ratings of Audio Amplifiers.....            | 22            |
| Regular features                                                |               |
| Alumni Notes.....                                               | 17            |
| Words on Radio.....                                             | 14            |
| News from the Stations.....                                     | 7, 12, 13, 18 |
| Classified advertisements.....                                  | 22            |

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# New Police for Busy Air

Much stricter policing of the airwaves is expected as a result of administrative changes in the F.C.C., effective July 1.

Pointing out that forced wartime growth of radio communications has pushed the art ahead an entire generation, the Commission said that despite the vast new spectrum space available, the demand for radio channels still exceeds the supply.

To cope with this increasing radio traffic, the Commission adopted a new plan merging the Radio Intelligence Division (RID) of wartime counter-espionage fame with the Field Division. This combined unit is known as the Field Engineering and Monitoring Division, which will be headed by G.S. Turner, the field and research branch of the engineering department will be headed by assistant chief engineer G.E. Sterling, formerly chief of RID. Chief of the engineering department is G.P. Adair.

This new combined field engineering and monitoring division will act as the eyes and ears of the FCC throughout the nation.

Its major functions are: Monitoring the radio spectrum for the purpose of locating sources of interference to authorized radio services, and identifying all forms of radio transmission. The purpose of monitoring is to check the frequency and band width of licensed transmitters to see that they do not cause interference on adjacent frequencies in the same area or on the assigned frequencies in other areas, to assure adherence to international radio regulations and procedures, to suppress unlicensed transmission which is an illegal act and a potential, if not an actual source of interference, and to identify, detect, locate, and eliminate accidental interfer-

ence caused by defects in power lines, electrical equipment, and various electro-medical and industrial devices.

Other major functions of the Field Engineering and Monitoring Division are: detecting and locating illegal radio stations and developing evidence for prosecution, inspecting all classes of radio stations licensed by the Commission, conducting radio operator examinations and issuing licenses to those found qualified, measuring frequency and making technical analysis of the emission of radio stations, rendering an emergency direction finding service to all aircraft upon request, making field strength surveys of radio stations, conducting special engineering projects in connection with frequency allocations and related problems, and conducting propagation recording projects.

These functions will be performed in conjunction with the technical information division and the laboratory division of the field and research branch.

In the departmental service in Washington there will be four sections: inspection and operator examinations; technical operations; monitoring; and the administrative section.

In the field organization there will be two general groups; the enforcement offices, which are the field district offices and the sub-offices to which the larger investigation units will be attached; and secondly the monitoring stations, which consist of ten primary stations and thirteen secondary stations. The latter are less elaborately equipped than the former. For the purposes of administration, the nation will be divided into nine regions with a regional manager in charge of each.



# International Plans Outlined

A promising plan for the exchange of programs among college and university groups in all parts of the world has been advanced by IBS and has met with generally favorable response.

Following the endorsement of international operation by the May meeting of the Governing Council, Kurt Shell was appointed Director of International Broadcasts. Mr. Shell attended the Gymnasium in Vienna and in Mantua, and is a veteran of the Intelligence Division of the U.S. Army, in which he served in Italy and Austria. He will be attending Columbia University this fall, to study French and government.

Empowered by the Governing Council "to cooperate with other agencies in the presentation of programs for international use, to encourage good-will and understanding among college and university students in all parts of the world," Mr. Shell prepared a preliminary plan based on a study of the problem and consultation with other international and foreign broadcasting organizations and IBS personnel. Several important conclusions were reached. Among them were:

1. The Intercollegiate Broadcasting System should continue its policy of accepting all eligible groups in any country, and should not constitute itself an American organization. Broadcasts should be arranged for and between all cooperating countries, and the staff of the central office should not be limited to Americans.
2. The International operations of IBS should be organized and operated separately from the domestic activities, with independent staff and financing. It was decided that this plan would warrant grants-in-aid from one or more educational foundations if correctly organized, and that this source should be expected to cover the main part of the costs. It was recognized that

exceptionally competent leadership would be required for the project.

3. It was decided that the establishment in other countries of campus stations similar to IBS stations was unlikely, since neither campus community life or the terms of government regulation favor this type of activity. It was decided, however, that educational stations broadcasting to the general public were a distinct possibility in other countries (some may already be in existence) and that radio production groups similar to radio workshops were likely to be started.

4. The use of short-wave was discarded, except in special cases, because of the lower quality of reception, problems of time differences, and lower availability of short-wave receivers. Instead the use of transcriptions distributed by air express was decided upon. The standard radio stations or network of each country (except the US) would be asked to make time available for the broadcasting of these programs in university localities.

5. It was decided that IBS should restrict itself to programs and materials dealing with matters of special interest to university people, and that it should not deal with program types available from other services.

6. It was decided that the full cooperation of government broadcasting agencies in other countries was essential to the progress of the plan, and so the New York representatives of these agencies were interviewed. Encouraging offers of cooperation were received from all of them.

The preliminary outline submitted to interested agencies in New York said, in part:

"We believe that university people everywhere, both students and faculty,



have a stronger feeling of international unity and understanding than the general public. Exchanges of students and teachers have done much to bring schools closer together, and the cooperation of scholars and scientists the world over on common problems has furthered this feeling of understanding. The aim of our project is to increase the scope of this understanding and to bring university people into closer intellectual and cultural unity by the presentation on an international scale of programs directed particularly at college communities. They will be programs not available through other broadcast services, which, by giving free expression to differing cultures and attitudes, will help crystalize a genuinely international viewpoint.

"Existing international broadcast services are largely one-way arrangements and present primarily government-sponsored programs designed to interpret one nation to the rest of the world. The core of our plan is the production of programs with an international viewpoint, not representing any one nation, and not serving as the voice of any government. Material for programs will be drawn from the whole world of education and the programs will be presented to university communities in all cooperating countries.

"Among the programs presented should be documentary material on events of world importance, not reporting of world news, but rather the interpretation and discussion of material in terms of background and trends. The emphasis of such programs will be on the opinions and attitudes of university people everywhere about these events rather than on a narration of the events themselves. Such documentary programs would make use of dramatic techniques and of recordings of the actual events as well as narration and discussion. Recordings of important events, including meetings of the various UN councils, speeches, and "on-the-spot" news events are available and can be used in later documentary programs of this kind.

"In the United States the broadcasting of these programs to their intended audience will meet with little difficulty. Member stations of IBS, educational AM and FM stations, and, wherever necessary, commercial stations, will bring them to uni-

versity listeners. In view of recent trends within the radio industry in this country, the cooperation of the latter should be readily forthcoming. In other countries, where broadcasting and higher education are partly or entirely state directed and where educational organizations have no station facilities of their own, the regular radio organizations will be asked to make time available on local stations serving the college communities."

#### "WORLD STUDENT FORUM" IS FIRST PROGRAM

A discussion program called "World Student Forum" was suggested for the first regular international program. For this series, a topic would be chosen each week from world affairs and their implications for education. Four or five cooperating college groups in different countries would receive a brief outline of the topic by cable, and each would be requested to prepare and transcribe a certain number of minutes of commentary. The commentary would be repeated in three or four languages, using foreign students and language students.

All transcriptions would be flown to a central point. There the moderator will transcribe an introduction and after studying the different comments, a summation. Then the program would be combined, making three or four editions in different languages. The resulting programs can then be copied and flown to all the cooperating stations.

The same procedure of assembling material from the participating groups and recombining it can later be applied to other types of programs. A documentary news program has been suggested as one of the next programs to be started.

Having received promises of cooperation from key offices, the project is now ready for the establishment of its central office and solicitation of operating funds.

In addition to the plan advanced by IBS, other promising arrangements for exchange programs with colleges in other countries have been discussed. Various organizations which now broadcast overseas have shown interest in obtaining programs from IBS on subjects relating to college life and education in the United States.



# Survey Coding

## Nears Completion

The national survey on campus listening habits and preferences, which has been conducted by IBS this spring, is entering its final phase. Although many parts of the operation have fallen behind schedule, the final national report is expected to be published before the opening of the fall academic term.

Directed by Harriet Linton, Research Director of IBS, the survey comprises approximately 2,000 interviews which insure unusual reliability. The interviews have been administered by students in the co-operating colleges, and the data returned to New York for tabulation and analysis.

### WHAT MAKES A STATION POPULAR?

Although final figures are not yet available, many significant trends can be seen in the partial tabulations assembled to date. Campus stations differ immensely in popularity. Proportions varying from 10% to 90% in different colleges have been recorded as listening to the campus station once a week or more. The variations in popularity seem to be caused by several different factors. Most important of all, of course, is the quality of the station's service to the college community. This is shown by the responses to many different questions, and correlates with popularity. But prominent among the auxillary factors affecting popularity are these:

1. The age of the station. It takes time to build an audience, as is shown by the fact that the stations which have been established longer are more popular than recently-founded stations. Even though the campus population changes fast, a station becomes an institution in time and a part of campus life.

2. The type of college. Popularity is highest in small colleges located away from urban areas, where the campus community is closely knit and there is more interest in activities. The integration of the community is shown by such factors as the number of students who participate in activities. The lowest popularity is found in large universities located in cities, where students have more outside interests. This results is not caused by the larger number of day students in such universities, because they were not included in our sample.

3. The competition offered by other radio stations. Popularity of the campus station is less in urban areas where diverse radio service is available. In this connection, there are many ways in which the campus station can attract an audience by providing wanted types of programs which are not broadcast over local stations. A question on "Are there any types of programs you think should be broadcast more than they are now?" brought a surprisingly large number of affirmative responses, indicating dissatisfaction with available service. Types of programs most often asked for were musical, with a great majority asking for serious music.

### MUSIC IS TOPS

Program popularity scales show popular, symphonic, and semi-classical music leading the field almost equally, but standard stations available to students evidently offer nearly enough popular and semi-classical music, while neglecting the serious music field.

Next in popularity after musical programs are news bulletins. Many significant differences are seen here between men and women, veteran and non-veteran men. Women



like plays, discussions, and most types of music more than men do. Men, as might be expected, like sports and comedy programs more than women do.

The average veteran likes a larger number of types of programs than the non-veteran, and shows a preference for more serious types of programs. He likes all types of music, news (both bulletins and commentators) and discussion programs. He does not like plays or sports as much as the non-veteran.

Upperclassmen show fewer "likes" than freshmen. In fact, the only programs which appeal more to seniors than freshmen are news bulletins and symphonic music.

The things which listeners like about their campus stations vary greatly from one college of another. Chief among them are the preponderance of music, especially symphonic, and the "personal" aspect of the station - the fact that they know the announcers, that their requests are played, they feel personally involved in the station, or just "the fact that it's a campus station."

Criticisms of the campus stations, on the other hand, fall into a few major groups. Technical difficulties and poor reception are most often mentioned. Poor programs with "too much horsing around" are second in number of mentions, with gripes about specific programs following.

The hours when most people listen to the radio vary surprisingly from one college to another. For the college audience as a whole the peak period is between 9:00 and 10:30 PM, but there are some colleges where the peak occurs at a different hour.

While the average listening time is near two hours, many do not listen at all, and some listen much more. One respondent, the record to date, listened 13 hours on the day checked.

The large majority of students have radios in their rooms, and practically all have them available. More men than women have radios in their rooms, and women show a greater tendency to listen in other people's rooms and in social halls.

Students do not listen to the radio as much as the general public, but they listen an appreciable amount - an average of two hours per day. While we have found that the amount of listening differs appreciably in different colleges, in all cases men listen to the radio more than

women do. This is surprising because all previous studies show that in general men do not listen as much as women.

Each interview takes approximately 15 minutes. During this period the respondent is asked about the hours he listens to the radio, what types of programs he likes, his favorite stations, and why he likes them. Several questions on the respondent's attitude toward the campus station follow, and personal data about the respondent.

When they are received in New York the interview blanks are stamped and numbered before being coded. Coding is the process of translating all data on the interview into a numerical code which can be represented by holes punched in the tabulating cards. The coding is divided among a number of workers, each one concentrating on several questions but by the time an interview has traveled the entire course, approximately one hour of time has been spent on coding it.

From the code numbers, an operator punches the cards, one card for each interview. The cards can then be counted and sorted at high speed by the tabulating machines.

An individual report for each college where the survey was conducted is prepared, with a brief discussion of the most important results. These individual reports have been completed for \_\_\_ colleges and are in preparation for many more. They have supplied many suggestions for the stations, and have caused revisions in the program schedule in several cases.

Two preliminary reports on the total results have been made. The first was given at the round-table discussion of campus radio at the Institute for Education by Radio Columbus early in May. It was based on the more important results of the small number of interviews received by that time. The most important result, and the one which occasioned the greatest interest among the educators and radio executives attending the Institute, was the feeling of dissatisfaction with present radio service expressed by 70% of our respondents. This is of particular interest

(Continued on Page 16)



# New Plan For Publications

Increased emphasis on publication as a concrete service for member stations was recommended by the Steering Committee in a recent memorandum. This committee has met weekly since January, 1946 to consider all aspects of IBS policy. In a detailed memorandum circulated to IBS personnel recently, the committee pointed out that publications are among the least expensive forms of direct service to members, and that the cost per station is reduced as the membership continues to expand, while many other services, such as network operations and field service, increase in cost as the number of stations increases. During the period when activities must necessarily be curtailed, the committee urged that greater attention be paid to publishing much of the information which is now available to members only on direct request.

One of the ever-present problems of the campus station is the adequate training of personnel in basic broadcasting techniques. To aid the station in meeting this problem, the committee proposed a series of handbooks covering different aspects of broadcasting practice. A handbook for announcers was suggested, to be printed in a large enough edition to provide each station without cost any reasonable number of copies for distribution to new staff members interested in announcing. It was suggested that the series be continued with handbooks on sound effects, programming, production, writing, control engineering, and any other fields which appear to be problems.

The committee urged that these handbooks be revised every year, and a new edition brought out each fall before the opening of the academic year. Additional material

will be published in Bulletin articles as it becomes available, and then included in the next revision of the handbook.

Sale of IBS publications to non-members was urged, as a source of slight secondary income. Reasonable purchase prices are to be assigned to all publications except the Technical Data Book, the contents of which are restricted. Member stations and Trial and Affiliate Groups will be allowed free copies within reasonable limits. The handbooks are conceived as increasing in value as each new edition revises and augments the material in the light of experience.

In addition to the handbooks, the Committee considered the "Station Executive's Handbook" now in preparation and recommended a change in the material, producing one booklet devoted exclusively to a brief, interesting description of what IBS does and how, the identity of various committees, boards, and councils, list of IBS personnel, and the Constitution, By-Laws, and Codes of Practice as an appendix. Ruth Jacoby, manager of WBS Wellesley was chosen to prepare this booklet for distribution to all officers of IBS member stations at the opening of the fall semester.

The articles on the functions of different departments within the individual station, which have been appearing in the Bulletin, are to be reprinted in a separate monograph on the "Organization of the Staff for a Campus Station."

A new edition of the brochure "This is the Intercollegiate Broadcasting System" has been published, giving introductory information on campus radio and the IBS in a somewhat fuller form than the first edition. The committee recommended the preparation of a new booklet on how to start a campus station, covering problems peculiar to the first stages of station life.

Increased use of the photo-offset process, with more drawings and photographs, was urged, with more attention to attractive layout and ease of reading.

Participating in the discussions were Paul Yergin, Ruth Jacoby, David and Harriet Linton, and Sunny Brown. The plan has not yet been made final, and the committee is anxious to receive your comments and suggestions.



# Alumni Club Formed

An active organization of IBS alumni, proposed several years ago by George Abraham, Executive chairman, will soon become a reality. Increasing interest shown by those alumni who have retained contact with IBS has spurred the effort to locate others.

Now that many service men are returning, a concrete plan for the organization of an alumni club has been set up. The first step is the compilation of lists, as complete as possible, of all past officers of IBS stations. Stations which were formerly members or on trial are being included. Over one thousand names have been extracted from the files and listed to date. These lists are being sent to interested alumni for additions and corrections. Then those names for which addresses are still missing will be sent to the alumni office of the college with a request for current addresses.

A survey will be conducted among these people to determine their present addresses and occupations. Of particular interest will be the group which has continued in the radio field after graduation.

George Abraham will act as secretary of the alumni group, and there will be a regular column in the Bulletin devoted to alumni activities. Subscriptions to the Bulletin will be included in the club membership.

## KTX MANAGER IN TOWN

Page Boyer, long manager of station KTX at Stephens College, is spending his sabbatical year in New York, acting in radio and stage shows. Manager of KTX for the next year will be Ken Christiansen, who has taught radio at Indiana and South Dakota universities.

## Station KBYU

### New IBS Member

Station KBYU, at Brigham Young University, was granted full Membership in IBS May 26, 1946. The station was started late in 1943 by Dr. T. Earl Pardoe, head of the Speech Department, to be used by Speech students interested in radio.

The station has two studios, now being improved, and covers about 2500 resident students. The staff of 26 broadcasts six days a week, 12:30 to 1:00 PM and 6:30 to 7:00. Radio students also appear on university programs carried on two local stations, KSL and KOVO.

Student officers for the station are:

Lester C. Card.....President  
Evan D. Wimber.....Vice-President  
Rita Clement.....Secretary  
Dewain Silvester....Program Manager  
Darrell Rhodes.....Business Manager  
Lester C. Card.....Technical Manager

Faculty advisors are Dr. Pardoe and Mr. O. N. Geertsen of the Engineering Department.

The number of IBS stations has increased 15% in the last three months, bringing the present total to 401. New members include: WHC, Hamilton College: prewar IBS station back on the air; will apply for Membership this fall.

Texas State College for Women: the Speech Department is building a campus station for use in conjunction with class work.

Colorado State College of Education: there was a prewar Trial groups here; interest has been revived by Patsy Whitman and fellow students.

Rutgers: students here are installing a station in conjunction with the college Public Relations Department. Studios will be used for recording and originating shows broadcast over local stations, as well as for campus broadcasts.

GBS, Georgetown University: students on this campus in Washington are rebuilding the prewar campus station, and hope to be on the air this fall.



# FACTS

## for music scripts

by F. John Pessolano Jr.

Writers of serious music scripts should remember that the listener wants to hear music. It is courtesy to tell him what he is going to hear and what he has heard, but other comments must be valuable in themselves to justify their intrusion on the music. The longer a script is, the better it has to be to hold an audience. The recent national survey conducted by IBS shows considerable sentiment for "uninterrupted music", much less interest in commentary.

If the listener learns something about the music, the composer, or the artist which increases his interest in the program so much the better. But about the twentieth time he hears that Beethoven originally dedicated his E<sup>b</sup> symphony to Napoleon, then found out what a heel Napoleon was and changed his mind, our patient listener in all likelihood will not only object, but turn his dial swiftly to another station, even if he wants to hear the music. Therefore unless you have something to say that average listener hasn't already heard through the courtesy of Deems Taylor or some other purveyor of musical trivia, DON'T SAY IT!

Scripts should not be filled with a lot of technical material which is of interest only to someone who is already versed in such things. Joe College is probably not interested in the scoring of "Colas Breugnon". However, if you can keep your continuity from sounding like an erudite lecture, why not tell your listeners a few words about Stamitz and the Manheim orchestra? Their contribution to symphonic music is incalculable.

Every station ought to have a library of books on music as well as the usual books on production, programming, technical data, etc. So here is a list of some of those which I have found most helpful in preparing scripts:

THE GRAMAPHONE SHOP ENCYCLOPEDIA OF RECORDED MUSIC: (Simon and Schuster, \$3.75) This, above all, is the book for every radio station. It will identify any composer represented on records (and some who aren't), list all the available recordings of his works, and tell you which is best and which isn't, and will throw in such priceless gems as "Nevin, Ethelbert (1862-1901)

Nevin was an American composer of trifling piano pieces and songs without number. Today even his most famous song - "The Rosary" - is little heard, a fact serious music-lovers may regard with pride and gratitude."

THE HARVARD DICTIONARY OF MUSIC: WILLI APEL (Harvard Univ. Press, \$5.00)

An invaluable work for the script writer of any intellectual level. Should you run across a term that stumps you, it would probably also stump the listener. This volume will clear the matter up in no time flat, and can tell you more about it than the head of your local music department could assimilate in one sitting. Contains lists of periodicals, and other bits of information. Well worth the price.

THE MUSIC LOVERS' HANDBOOK: Elie Seigmeister (Wm. Morrow & Co. \$4.00)

The list of contributors to this one reads like "Who's Who in Music". Every article is authoritative, easy reading, and most valuable to a station. Highlights are sections entitled, "In the Concert Hall" which contains program notes on hundreds of compositions we all use, "Meet The Composer" which has a lot of biographical material. 798 pages of very useful stuff plus a complete index.



**THE RECORD BOOK:** David Hall (Smith-Durrell  
Various prices depending on edition)

This excellent work contains not only a comprehensive list of recordings, showing preferences, but scads of miscellaneous material on individual works, composers, artists, recording techniques, and a buyers guide for needles, and practically everything else pertaining to records. It is informative, and easy to read, the perfect help for the harassed writer. Available in the complete edition, or the first edition with individual supplements at 75¢ each.

**THE METROPOLITAN OPERA GUIDE:** Peltz and Lawrence (Modern Library Giant)

This is the perfect opera book for stations. It contains beautiful summaries of the plots of any operas you're likely to use, and timings of all the acts, and best of all, the text indicates exactly where every major aria comes, and who sings it in case you want to do a large chunk of opera with running continuity. Also contains lists of recordings, etc.

**DICTATORS OF THE BATON:** David Ewen (Alliance \$3.50)

This little epic must have been inspired by the same good angel that keeps most IBS stations on the air. It is the script-writers delight in capital letters, as are "Men and Women Who Make Music" and "The Book of Modern Composers" by the same author. Practically indispensable if you happen to be doing a series on great conductors as I was when I discovered it. Covers them all from "Toscanini - The Paragon" to the late Erno Rapee. It is divided into sections such as "The Showman Conductor", "Of European Traditions", "Men Over The Radio", and six others, giving, in the words of the jacket "an intimate appraisal of America's thirty leading symphonic conductors and their famous orchestras."

**THE VICTOR BOOK OF THE SYMPHONY:** O'Connell (Simon and Schuster \$3.50)

Frankly, this one isn't too hot, but it does contain program notes on some things which aren't available elsewhere. Very much behind the times as far as the moderns are

concerned, it contains much the same sort of thing found in the booklets that come with albums. (as a matter of fact, some of the booklets are reprints of notes in this volume) Not too bad, but some of the others do the same thing better.

That about finishes the books, but there are other sources of information that should not be overlooked by the eager script writer. One of the most obvious of these, of course, is the booklet that usually comes with an album of records - they are now printed inside the front cover of the album. Some of these, of course, are pure trash from beginning to end, but those released by Victor include some by Abraham Veinus (usually identified by name, or by his initials on the back of the pamphlet) and Samuel Chotzinoff. The early Columbia booklets were almost all uniformly good, but one should pay particular attention to those by Paul Affelder. In particular, the booklet which Victor issued with the complete recordings of Chopin's "Nocturnes" is excellent.

For those of you who are fortunate enough to have access to a music library, the Schirmer albums of scores generally contain authoritative notes by men like James Hunecker. These notes are usually exceedingly technical, but frequently one can glean some good material from them.

Last, but not least, don't overlook the record stores. Most of the large ones publish their own record magazines, and will be glad to put your names on their mailing list. The one published by the H. Royer Smith Co. (Walnut and 10th. St.) in Philadelphia is very good. A year's subscription can be had for 50¢. The Gramophone Shop Supplement (The Gramophone Shop, Inc., 14 E. 48 Street, New York) costs twice as much, and is more complete, listing all new recordings not already reviewed, and almost always contains good script material. Both shops, incidentally, handle foreign recordings, and will arrange to send you announcements of their arrival.



# IBS People Go West

A large number of the staff members of IBS and member station executives are out West this summer. Kurt Shell, IBS International Director, is in Livingstone, Montana, on a ranch; he recently visited Norman Penwell of the Montana State College station staff, and expects to visit Patsy Whitman at the Colorado State College of Education.

Don Sohn, of KSLU, is touring the American and Canadian Rockies. He has also visited Montana State College, where he discussed the campus station with Prof. Lawrence Binder, the faculty advisor. Don expects to visit some interested groups on the West Coast if his itiniary permits.

CURC's Bill Lancaster and Tak Kako are making several short trips, starting from Denver. They expect to visit KBYU, IBS Member station at Brigham Young University, and the many groups in California, Washington, and Oregon which have expressed interest in starting campus stations.

They recently visited the University of Washington at Seattle, and reported increasing interest in radio there.

## WBS SCRIPT CHIEF WINS MLLE. AWARD

Sue Kuehn, head of the Script Division of WBS, Wellesley, has been awarded the Made-moiselle Short Story Prize for her story "The Rosebush" which was published in the August (College) issue.

Sue has been a member of the fashion magazine's College Board for a year, and was one of the guest editors for the 1946 College issue.

## WESLEYAN STATION RECONVERTS

Station WES is completing its reconversion from a chaotic wartime status. The small group of staff members at college this summer is working to eliminate the makeshifts used last winter, and is reorganizing the whole Cardinal Network. Records are being catalogued and storage facilities found; furniture, and signs for the entrances to the station, are being painted.

Plans have been made to start the staff and broadcasts off with a band when a new student body - 100% enrollment increase - descends on the campus. The exact program schedule has not been made; hopes are for a good balance of popular music and jazz, drama, news and news comment, and serious music. Charles Stone's "Best in American Jazz" and the "Cardinal Radio Workshop" will be among the features carried over from last year.

Howard Williams, Director of WES, reports that programs will also be slanted for the wives of veteran-students, and expects to have these wives prepare these shows themselves.

The station will broadcast from four to eleven PM daily, probably concluding with an all-request record show.

## BOOKLET TO EXPOUND STATION

### MYSTERIES FOR COLUMBIA

Station CURC, under new call letters, will return to the air September 24, with broadcasts Monday through Friday from eight to midnight. Bill Lancaster, station president, says the station will put on a big premiere show, probably broadcast from one of the campus auditoriums. Preliminary publicity will include a booklet on the operation of the station, to be distributed to the whole student body.

The station will have more room to work in next winter, as a stairway which occupied needed space is being removed, and movable gobos (used to improve sound conditions) will be replaced by sound treatment on the walls and ceilings.

Dem Telleman '48, was recently elected assistant engineer.



# New Calls BULLETIN GETS

Following the recent trend toward the adoption of call letters beginning with K or W, the stations at Cornell and Columbia will return to the air in October with new calls.

Cornell's outlet, formerly CRG, will become WVBR ("Voice of the Big Red") while the Columbia station will become WKCR ("King's Crown Radio") if that call is available. King's Crown is the organization of all activities in Columbia College; the former CURC belongs to it.

Yale, Swarthmore, and Brown are among the colleges where campus stations have recently changed their call letters to conform with standard station practice.

## STUDY OF RATES

A systematic study of advertising rates and sales to consider revising the rate structure has been proposed by the Steering Committee. A comparison of IBS rates with the rates of other media, including campus newspapers, will be made.

The problem of setting network rates will also be considered, as heretofore no network rates have been established. The arrangements in use in other networks are being studied, particularly the clause which give the network free use of a set number of commercial hours in order to finance sustaining service.

Intercollegiate Broadcasting Station Representatives (IBSR) is giving full cooperation on the study; members of the Board of Directors and alumni advisors will be consulted.

The New York Office staff expects to call an advisory meeting of station officers in the New York area to discuss the rate structure when data have been assembled.

## FORMAT CHANGE

This issue marks the beginning of a new format for the Bulletin, a product of the systematic study of IBS services which has been going on since the first of the year. Many new features are proposed, including some which have been included in this issue. The narrower column width will make for greater ease of reading, while special attention is being paid to the layout of material and the use of illustrations.

A more modern arrangement of the cover and greater use of photographs show their effect in this issue. Greater emphasis will be placed on feature articles about interesting original activities of member stations. Regular features will cover important happenings in the radio industry; a number of columns are planned covering new record releases, alumni activities, book reviews, and useful ideas. Greater coverage of the varied activities of IBS will be afforded.

The publication schedule calls for ten issues per year, to be mailed during the first week of every month except July and September. Coincident with the changed format of the Bulletin, the mailing lists will be reorganized for greater ease in handling large mailings. An edition of about one thousand copies is planned, of which nearly half will be alumni subscriptions. A subscription price of \$2.50 per year, or thirty cents per copy, has been established. All officers of Member stations and selected personnel in Trial and Affiliate groups will receive free subscriptions, as part of the station membership. Subscriptions will be offered to alumni and ex-officers. The deadline for submission of material for the Bulletin will be set on the tenth of the preceding month; photographs and cartoons will be solicited, as well as articles and news.



# Schedule Changes in Fall

## UCRS MOVES TO NEW QUARTERS

Programs at UCRS next fall will include more live shows, with dramatic shows put on by the students in the college's new dramatic course, and in conjunction with Skidmore College. The program schedule was revamped last spring along the lines indicated by the survey results; this process will be continued in the fall. Broadcast hours will also be changed; the station will probably be on the air from seven to midnight each evening. The station plans to broadcast all important sports events, and speeches and meetings of interest to listeners.

All station equipment was recently moved to new quarters, where the permanent installation (discussed at the convention) will be made. The station is now using the space "as is" for control room and studio.

Plans call for an extensive installation, which will include two studios with control rooms, master control, and an office. The master control equipment has been bought; installation is being started this summer.

The unusually complete and flexible plan for the entire station including all equipment and design of the studios, control rooms and office, was prepared by David Borst and Paul Yergin of the IBS Technical Department at the request of Wilford Ketz, Dean of Student Affairs at Union, and the station staff. Parts of this plan were included in the last addition to the Technical Data Book, and a detailed article will be published when the installation is completed.

A letter prepared by the staff in cooperation with Paul Yergin has been sent to former staff members returning to Union in the fall, asking them to rejoin the staff.

## SCHEDULE CHANGES AND NEW EQUIPMENT AT WSRN

Andy Weil reports that the WSRN staff decided to make several changes in the schedule as a result of the discussions at the last convention. The station will continue its excellent musical features, with light opera, Gilbert and Sullivan, and novelty shows rounding out the classical, masterworks, and Midat shows on the schedule. Time is left for interviews of prominent visitors on the campus and a "third degree" question period (a student-faculty show). No other quiz programs are planned unless the IBS survey, which will be taken in the fall, shows a demand for them.

At Weil's request, IBS Music Director Alan Rich is planning the entire serious music schedule for the station for the fall term. The last hour and a half of the broadcast day every evening will be devoted to serious music from a library of over 4,000 records. A detailed description of the method used in planning this schedule will appear in a later issue of the Bulletin.

The Swarthmore English and Language departments have asked for time on the station, and are now preparing programs. Co-operation with the Athletic department has been excellent; the station will supply the PA system for this year's games.

The station recently acquired a wire recorder for use in broadcasting campus events, and a Signal Corps short wave receiver for monitoring foreign broadcasts.

Campus publicity and promotion will start with a bang. The campus paper is going to print the station's schedule and publicize important shows; an evening program piped to the dining room, and a printed schedule of musical selections distributed to all students, will be utilized at the start of the year to build an audience.



## WILLIAMS STUDIO IMPROVED

Lawrence Heely, acting president of WMS, says that the station will broadcast from four to six-fifteen and seven-thirty to eleven each day. There will be a greater number of live shows broadcast; record shows will be built around regular themes and scheduled at specific times. Campus news, some sports shows, quiz shows, and a roundtable discussion prepared by the Williams Christian Association each week will be among the feature campus presentations.

The station's control room has been completely revamped, and the controls themselves improved. One studio will be partitioned to provide passage to an adjoining room.

Special provision is being made for returning veterans, who will not be obliged to go through a competition period before joining the staff; WMS expects veterans to make up the majority of members this fall.

A representative of WMS is serving on the Undergraduate Council Publicity Committee, recently formed to coordinate the publicity activities of all campus organizations.

MARY WASHINGTON CHANGES  
STAFF ORGANIZATION

Station WMWC will continue broadcasts from two to five every afternoon, presenting popular and classical record shows, and radio class presentations - music, drama, panel, and audience participation. Auditions for new staff members will be held September 17 to 20; broadcasts will start the following week.

Announcements for auditions will be posted on the station call board; weekly program schedules are posted in the same place. Special programs are featured on this bulletin board; such shows are also written up in the campus paper's radio column.

Staff organization has been changed; Station Manager Lois Anderson and the four members of the Board of Directors supervise the work of the Program, Business, and Engineering departments. The station now has a salaried secretary to do typing and record keeping.

WBRG HOURS TO BE THE "BEST"  
ON SURVEY RESULTS

The WBRG schedule for the fall will probably include two hours of broadcasts each morning, and from three to four in the evening, at the hours the survey report show best for student listening.

Cooperation with all campus activities is excellent; the campus news show is used to announce campus events; a plan for placing these announcements has just been made. The International Relations Club and the Christian Association prepare and produce weekly shows.

Physically, operation has been made easier by rearrangement of the control room. The college has bought recording equipment for use in the studios; the station has also bought other equipment to improve reception in the men's dorms. The studio ceiling was recently sound proofed.

Jeanne Morgenthal, WBRG manager, says that a meeting will be held at the beginning of the semester to organize the publicity campaign for listeners and recruiting of new members. Promotion stunts will include dinner music, printed program schedules in all student mailboxes, and a campaign for auditions.

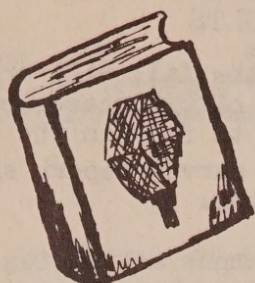
Jeanne Morgenthal is coding the Bucknell surveys, so that the station will be able to have its results as soon as possible. These results will be used in planning the schedule for the coming year.

## HAVERFORD GETS SECOND STUDIO

WHAU broadcasts next year will feature an early morning one hour show, according to Nick Hazelwood, station president. Special features will include presentations by the Glee Club, Debating Society, Dramatics and International Relations Clubs. Expanded facilities include portable equipment and remote lines; a second studio and complete sound proofing will ease operations and improve program quality. Returning veteran staff members will be given their old jobs insofar as possible.

(Continued on Page 18)





## WORDS ON RADIO

### *FCC with sex*

THE HUCKSTERS, by Frederick Wakeman

Criticism of radio by the FCC in its now-famous "Blue Book" was quickly followed by the publication of Frederick Wakeman's best-seller, THE HUCKSTERS. The novel is the tale of Vic Norman, who returns from service with the OWI, buys a \$35 tie, and with the full force of sincerity persuades the agency of Kimberly and Maag to hire him as account executive for the Beautee Soap account. Evan Llewellyn Evans, power-mad owner of Beautee Soap, runs all his employees and the agency with an iron hand. Vic welcomes the chance to go to Hollywood to arrange for a new show, meets Kay Dorrance on the Super Chief on the way out, and has an affair with her during his hectic stay on the West Coast. On his return to New York, he renounces Kay and resigns from Kimberly and Maag.

This is the bare outline of the plot of THE HUCKSTERS. But Frederick Wakeman is not just talking about radio; one could easily be entertained by just his easy style and juicy manner of story telling. Mr. Wakeman has succeeded in publicizing the recent FCC bombshell in an extremely effective manner; he mixed up the digs and the criticisms, the oversights and the extravagances, added a tempting dash of sex, and came up with the strongest argument for a radio renaissance we have yet seen.

"Evan Llewellyn Evans" and "Kimberly" (the real-life originals are but thinly disguised) may very well be trembling in their hand made boots, because THE HUCKSTERS is a well camouflaged exposé of the desperate money-mongering that could easily spell the downfall of the youngest, fastest moving industry in this country. There is "fun" in Mr. Wakeman's book; there's humor and a good story, but there is also a bitter and intelligent comment on what is wrong with American radio and the people who make it go. THE HUCKSTERS shows that the profit motive is king, that "public interest" is little more than a phrase in station licenses. It also shows, through Vic Norman's melodramatic about-face, that there is still hope, that there are still people big enough to stand up for what the first-grade primers and high school history books taught them about the original intent of the free enterprise system.

There is still more to THE HUCKSTERS than that. Kim is insatiable in his particular way; Vic is nervous; Kay weakens. There is a complete lack of mental well-being, temporarily stayed, like hunger, by gin rummy and strong drinks, that is more than an occupational neurosis. The book is not only a book about radio--it is also a commentary on our civilization. What is the end of striving? What is left for a man when he achieves material success without the pot of gold he expected? What is wrong with our way of life if we find huge gaps and voids when we do acquire financial security and an "interesting job"? Where has happiness gone in our day and age?

These questions stand out in a perusal of THE HUCKSTERS; only feeble answers appear to calm us as we finish the book. The book is bright and humorous, and somewhat racy; it is also the truth. Mr. Wakeman has managed to glimpse the foolish tail-chasing that characterizes the whole of modern business; his clever writing makes the questions he raises more disturbing.

Ruth Jacoby



**RADIO, THE FIFTH ESTATE, by Judith Waller**

The second of a series of radio textbooks written from experiences in teaching the classes at the NBC-Northwestern Summer Radio Institute fills a great need in the study of radio. There are numerous texts available on radio engineering, and an adequate supply of books on radio writing and production-directing; never before has there been an advanced and detailed text which covers the radio field as a whole. Not only has Miss Waller written an excellent survey of radio, but she has also presented complete material on public service programs and the problems involved in their presentation.

The whole field of radio - a new, growing, and somewhat confusing industry - is presented quite logically. The organization of stations and networks is detailed to show the interrelation of various divisions; experts in particular fields were called in to present complete surveys of their specialties. The relations of advertising agencies to programming, the importance of audience research, the place of listener councils and radio workshops are thoroughly expounded. This book should be studied by all those who are beginning work or are interested in radio, and is an invaluable reference for those who want to learn more about radio as a whole.

The appendix contains a carefully prepared bibliography of books and articles on radio which is a useful guide for those who want to study any part of the field in more detail.

Judith Waller, author of the book, is head of the NBC Public Service Department in Chicago. She is Co-Director of the NBC-Northwestern Summer Radio Institute, and was recently elected to the IBS Board of Directors.

**HOW TO AUDITION FOR RADIO, by Ted Cott**

Ted Cott, Program Manager of New York's station WNEW, has prepared an excellent guide for aspiring announcers and actors. The book contains a concise explanation of the way radio works, and a fine analysis of the requirements for different jobs in the acting and announcing field. There are many useful tips on whom to see for auditions,

the types and amount of material to prepare, and the methods to use in determining one's best character types. The second half of the book contains sample scripts calling for different types of performances, quick character changes, and varying interpretations, as well as commercial continuity for announcers.

All would-be announcers and actors should study this book; the audition material can easily be used over and over again. Campus stations should have a copy on hand to use when auditioning aspirants, as well as for a guide to more advanced staff members.

**THE BIG NOISE, by Fielden Farrington**

This current novel with a radio background has a theme painfully like *THE HUCKSTERS*; the central character is an insufferable heel who has become a big radio producer. After marrying a rich wastrel (and being well rewarded for taking her off her father's hands) he finally realizes the futility of his life and tries to find a new meaning through a study of the culture of the theater. *THE BIG NOISE* is full of good radio production background, and makes interesting reading.

**CAMPUS VS. CLASSROOM, by Burges Johnson**

A college professor emeritus, Mr. Johnson has drawn upon his experiences on three campuses to show the relation between life, studies, and campus activities. His analysis of the power of extra-curricular activities in claiming the major loyalties of the "student," of the exploitation of students which leads to indifference or disapproval by college administrations, and his suggestions for a better integration of campus and classroom life make interesting reading. This book calls for thoughtful reflection by undergraduates and recent graduates; it also offers some clues as to why campus stations sometimes have difficulties with their administrations.

**THE FIRST FREEDOM, by Morris Ernst**

Morris Ernst, lawyer, writer, and mainstay of the American Civil Liberties Union, has written an excellent book on the monopolistic trends and practices which tend to limit the types of material presented to



the American public through its press, movies, and radio. After explaining that magazine and book publishers, because of specialization, are not practitioners of such monopoly, he analyses the causes and results of monopoly in the other fields - the movie companies controlling large chains of theaters; newspaper chains in one-paper towns; vicious competition in big cities; the many areas of the country where radio stations are few and service is poor. Even though the monopolistic trend he so aptly portrays has not yet endangered American life, the warning and suggested remedies are well worth study by anyone interested in these mass communication media.

#### OPPORTUNITIES IN RADIO, by Jo Ransom and Richard Pack

This concise and informative pamphlet has an excellent outline of the precise jobs done in radio's many different fields, and a listing of the qualifications for each job. The book should be used by would-be radio workers; it will serve as a guide in training for radio work, and for stations trying to organize on efficient lines.

#### RADIO ALPHABET, the Columbia Broadcasting System

CBS has done it again! This time it's an amusingly written and delightfully illustrated small book with definitions of all the common, and some not-so-well-known, terms used in radio--in production, in engineering, in television, and by radio people in general. A handy reference book, which delights while informing.

#### RADIO'S SECOND CHANCE, by Charles Siepmann

Charles Siepmann, one of the researchers for the famous "Blue Book," has extended the analysis of the facts he discovered in preparing the report into a very readable book. He has carefully discussed the policies of networks and stations which limit some public service activities, and shows how the advent of many FM stations, widely distributed and serving special parts of the listening audience, will improve the radio picture, and enable the listener to have more diverse programs.

(Continued from page 5)

in the light of the controversy still going on within the radio industry over the need for improved public service.

The necessarily small number of copies of the report, entitled "Radio on the Campus", which could be reproduced at the eleventh hour before our departure for Columbus were eagerly sought by Institute members and the supply was soon exhausted.

The second preliminary report was made at the IBS Convention later in May. An interesting discussion was held on the implications for program policy of the information shown.

The final report will be based on the full quota of almost 2,000 interviews, and will include more complete data on special segments of the campus audience than can be studied in the individual college. A number of requests for copies of this report are already on hand and considerable interest has been aroused.

To date the coding has been completed on almost 1200 interviews. The greater part of the work has been done by Harriet Linton and Kurt Shell, Director of Inter-

national Broadcasts. Other volunteers, including Jeane Morgenthal, President of WBRG, Bucknell, have contributed considerable time.

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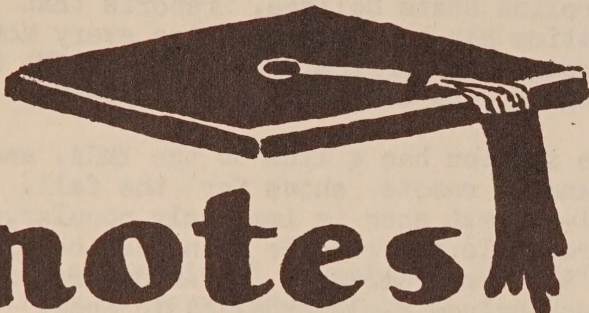
#### GEORGETOWN TRANSMITTER NEARS COMPLETION

Technical problems - the installation of facilities for the station - have claimed all the attention of the staff of GBS, new IBS Trial member. Fred Collins, head of the student group, reports that the transmitter (similar to the one used at MacMurray) is being built, and that the power supply unit was recently completed.

The GBS staff is receiving help from two presidents of the prewar station, Carl Bunji and Jack McGill. A smoker will be held at the start of the fall term to recruit a full staff.



# alumni



# notes

Lincoln Diamant, Columbia '43, and former IBS Business Manager, is now working as Promotion Director for the Book Find Club.

Victor Rosenblum, CURC president in 1944-45, is now studying law at Columbia. He is acting as a consultant on the IBS international project.

Ira Gabrielson, Columbia '44 and president of CURC, is completing his medical studies at the College of Physicians and Surgeons in New York.

Gordon Graham, Technical Manager of WBRU in 1944, is working for the Westinghouse sales division.

Myron Curry, WBRU president in 1940-41, is planning to start graduate work this fall. He was recently discharged from the Army.

Bill Hutchins, Columbia '40 and IBS Technical Advisor, is supervising the installation of an FM station for the New Bedford Standard-Times.

Tom Wertenbaker, WPRU president until his graduation in June '45, is assistant manager of station WNBH, New Bedford.

Bill Sullivan, WHCN president in 1944-45, is working at the Hedgerow Theater, just outside Philadelphia.

William Wise, Columbia '45, is working at a camp in Lenox, Mass. this summer.

Carl Bunji, Georgetown '43 and founder of GBS, is back at the university in the law school. Jack McGill, former president of the station, will return to the campus to finish his senior year this fall, and will work with the group now rebuilding the station.

H. Grant Theis, Princeton '42 and founder of WPRU, has returned to his job on the CBS Sales Promotion staff after service as head of the AFRS station at Dutch Harbor.

Alan Rich, IBS Music Director, has left CBS to work as an announcer at station WWNY, CBS affiliate in Watertown, N.Y. He is a graduate of Harvard, and worked on station WHCN.

"Forever After," interview show of couples celebrating their golden wedding anniversaries, by Bill Saunders, Brown '43, was recently reviewed favorably in Variety, a show business weekly. Bill was formerly Program Manager and President of WBRU.

Lou Bloch, Brown '40 and recently IBS Business Manager, is now head of Bloch-Joseph Associates, a talent-production company in Cleveland.

James Sondheim, CURC Business Manager in '41-'42, is now working on Neilson surveys at CBS. He served as an Air Corps radar officer during the war.

Peter Thorpe, former WBRU Business Manager, has returned from Navy service and is now attending the Harvard Business School.

Ed "Shifty" Schiffmacher, Union '45, is now working as an instructor in the college's Electrical Engineering Department. Shifty was president of UCRS.

Wes Vivian, Union '45, has returned from Navy service, will soon start work for the Sperry Gyroscope Company.

Bob Currie, U. of Pennsylvania '46, is an instructor in English at his alma mater. Bob was president of WXPB until his graduation.

Dick Rivers, Haverford '46 and WHAV Chief Engineer, is now working in the Haverford Physics department.



### WOUB STAFF DOES LATE EVENING BROADCASTS THIS SUMMER

Station WOUB at Ohio University is operating with an all-student staff this summer, under the managership of Al Fiering, while their faculty advisor takes advanced studies in Colorado. A new organizational plan has been instituted, centralizing the responsibility in a station Manager.

Fall broadcast plans include a morning "wake-up" show from 7:30 to 8:30 and evening shows from 9 to 11. Coeds will take part before their 10 o'clock curfew. The station plans to transcribe some dramatic programs for use after that hour, and will rely on recordings and transcriptions.

Publicity this term has been successful, with daily schedules printed in the paper. Recently the paper's interview column featured student comments on the station.

John Metzger, founder of WOUB, is returning to college this fall, and is expected to be active in the station.

### WXPN STAFF INSTALLS ANNOUNCING BOOTH

Station WXPN will change its program schedule this fall to conform with the listener preferences shown in the IBS survey. Shows will include broadcasts of football games from Franklin Field, basketball games, and campus events. The station is having an announcing booth installed, and its audio equipment rebuilt. Fall publicity plans include posters, ads in the campus paper, and a new hearing period.

### RUTGERS STATION ORGANIZATION PLANS NOW COMPLETE

The student broadcasters at Rutgers, who recently joined IBS in Trial Status, are reaching the end of the "formative" period and hope to start broadcasts at the start of the fall term, in the middle of September. Programs will be almost entirely live;

(Continued on Page 22)

### WNCS PLANS FULL OPERATION FOR FALL

Samuel Bruce Pettaway, Acting Program Director for WNCS, IBS Trial station at North Carolina State College, reports that the station has been broadcasting every Monday through Friday from 8:00 to 11:30 PM. Coverage of the campus is now complete.

The station has a line to the YMCA, and is planning remote shows for the fall. The all-request show is immensely popular, with more calls for records than can be filled in the time allowed. Other program features include a classical music show, "The Concert Master," and "Varsity Theater Teletones," popular music with phone calls; if the person answering the phone can tell the name of the show at the local theater, he wins a free pass to the show.

News programs are presented using wire copy from the United Press. A local record store gives the station free use of records in return for plugs.

Station WNCS expects to become a full Member of IBS as soon as it can fulfill the Technical Code requirements by adding a second turntable to the studio equipment.

### WELLESLEY STATION

#### IN NEW QUARTERS

WBS will return to the air soon after college opens September 29. Plans have been made for a more complete and varied schedule than ever before. Ideas are being discussed for a current events discussion panel of student opinion, daily world news service, and more programs in conjunction with WHCN (Harvard), a policy started this past winter. WBS will also be prepared to follow or lead any all-college activities like the UNIO and World Federation program of last winter.

On their return to the campus, members of the WBS staff will find the station moved to new quarters in Alumnae Hall. Although considered temporary, the new location will afford two studios and a control room.



# Intermodulation Distortion

By conventional standards an audio amplifier is considered of good design if tests demonstrate a constant frequency response over a wide range of frequencies, and low harmonic distortion in the output when a sine wave signed at one frequency, usually 400 or 1000 cycles, is applied to the input. Qualitative listening tests between amplifiers of similar characteristics on the above basis have revealed that often one will perform with much greater satisfaction than the other. Recently the literature has advanced the concept that the intermodulation distortion is responsible for the difference in performance of the two otherwise very similar amplifiers.

Intermodulation distortion may be detected when two sine wave tones are applied to the input terminals of an amplifier. Then, if this type of distortion is present, the amplifier output will contain power at frequencies which are the sum and difference of various harmonics of the applied frequencies. These intermodulation products are not necessarily harmonically related to either of the original tones. Therefore they are often more noticeable and annoying than harmonic distortion of either original frequency.

As yet, the radio manufacturing industry has not standardized on any standards of measuring this type of distortion, or permissible limits for it. However, there are definite trends which may be reported at this time. Usually the two test frequencies chosen are near the end of the response of the amplifier, since it is usually at the high and low frequencies that the most intermodulation distortion takes place. A typical pair of frequencies is 100 and 7000 cycles. In addition, the high frequency tone is usually attenuated 12db with respect to the level

of the low frequency tone, to accentuate the effect of low frequency intermodulation.

Intermodulation distortion of two percent or less under these conditions is not noticeable, and therefore seems to be a good criterion for broadcast equipment, at rated amplifier power output.

One of the principal sources of intermodulation in power amplifiers is the output transformer. The distortion usually takes place at the lower frequencies, and is the result of inadequate iron in the transformer. The transformer iron saturates at high power levels. With transformers designed as they are today, the best precaution is to use a unit rated three or four times the power it is intended to handle.

Obviously, amplifiers designed with a minimum of transformers, and with oversized transformers where they must be used, will have superior intermodulation characteristics.

The following articles appearing recently in the literature will provide further insight into this problem of inter modulation distortion:

"Audible Audio Distortion" Jan. 1945  
Electronics page 126

"High Quality FM Reproduction" Jan. 1946  
FM and Television page 28

"Audio Distortion in Radio Reception"  
Mar. 1946 FM and Television page 24

"Measuring Audio Intermodulation"  
June 1946 Electronic Industries page 56

"Intermodulating Testing" July 1946  
Electronics page 123

Two references in Proceedings of the IRE Dec. 1941 and Sept. 1942 are also of interest.

David W. Borst

## NOTICE

In this issue of the Bulletin, the technical material which has heretofore appeared in a special Technical Edition, has been combined with the regular edition.

The bibliography of articles in current engineering literature has been omitted from this issue, but will be continued in the next.



## REDUCING TRANSMITTER HUM AND RADIATION OF HARMONICS

Carrier hum and radiation on harmonics of the fundamental frequency are two common troubles encountered in small transmitters used for campus broadcasting.

Three sources of hum may be contributing to this disturbance. First is the obvious difficulty of too little filter in the d-c supply. This may be in one of the earlier audio stages, so for a test the modulator tubes should be moved, stage by stage, meanwhile noting any decrease in hum.

Improperly grounded a-c heater circuits will cause hum. These circuits should be grounded, either the center tap of the heater winding or, if that is not available, one side of the heater circuit should be grounded.

The third source of hum is back-feed of supply-frequency power into the transmitter plate circuit through the coupling device, if the transmitter is coupled into the a-c supply. In small transmitters, if appreciable power at the supply frequency is fed back, it may plate modulate the transmitter and thereby introduce considerable hum. A capacity coupling scheme is especially likely to produce this difficulty. A good preventative is to couple the output of the transmitter into a second tuned circuit (an auxiliary tank circuit), coupling being done by a link having two or three turns. The a-c system should in turn be coupled to the auxiliary tank. If the midpoint of the link is grounded there will be little possibility of supply frequency energy getting back to the power amplifier plate circuit and causing hum.

Often it will be found that a transmitter will seem to have a lot of hum during initial tests and yet perform all right when installed. This may be the result of the test equipment or of the method used for performing the test. When listening very near to the transmitter it may be that the oscillator (if it is a separate stage) radiates almost as much power as the modulated amplifier stage. This is especially true if the oscillator stage is not completely shielded. Thus, the percentage of modulation may appear low and hum may

appear to be excessive. If the receiver being used for the test can be removed from the oscillator's field, or if the oscillator is shielded, the hum will disappear.

Similarly it may be found that the receiver being used to test the transmitter is introducing the hum due to being in too strong an rf field (too near to the transmitter). Tune the receiver to a local station and notice if a hum is heard on this carrier. If a hum is present, chances are the receiver is at fault. Receivers with poor filter capacitors, and inadequate rf filtering in the second detector stage often introduce a hum on carriers which on better receivers are free of hum.

Transmitter harmonics are also quite strong near the transmitter, and may not appear to any extent on the rf transmission system. Harmonics can be reduced by proper design of the modulated Class C stage plate tank circuit, and by proper oscillator design. Sometimes, in order to achieve greater stability, an oscillator grid circuit is tuned to one half the frequency of the transmitter carrier. This procedure has the disadvantage that the third harmonic of the oscillator will be at  $1\frac{1}{2}$  times the frequency of the final carrier frequency. This  $1\frac{1}{2}$  harmonic may ride through subsequent tuned stages and appear as a powerful harmonic. The best way to prevent this is to operate the oscillator on the fundamental frequency for the transmitter.

A properly designed tank circuit for the modulated Class C amplifier will reduce harmonics. Such a tank circuit should have a fairly large tuning capacity. Usually fixed and variable capacity totalling about 0.001 microfarads is required. This large capacity will be effective in bypassing harmonics to ground.

Stray capacity coupling between the tank and the rf transmission system, in cases where inductive coupling is employed will increase the magnitude of harmonics on the transmission system. A Faraday shield between the tank coil and the coupling coil will reduce capacity coupling between them leaving only the desired inductive coupling. Such a shield may be constructed of a number of parallel conductors joined at one end but insulated from each other at the other end. The junction point of the conductors is grounded. For further details refer to the Radio Amateur's Handbook published by the American Radio Relay League.



## CONVERTING F-M RECEIVERS FOR

## USE ON THE NEW 88-108 MC BAND

Converting an FM receiver designed for the old 42-50 band for operation on the new 88-102 mc band is at best only a stop gap measure, but on this basis it can be done, and it may prove a desirable thing to do in some cases.

A converted FM receiver will never perform as well as a receiver designed for the new band for several reasons, the most important of which are as follows:

1. Since the intermediate frequency of most old band FM sets is 4.3mc, trouble may be experienced with images since the new band is more than 8.6 mc wide. Converting the if. to around 10 mc, the frequency required to prevent images on the new band, means practically rebuilding the old receiver and is not practical.
2. Oscillator circuits which are relatively stable on the old band may prove more unstable if raised in frequency to permit reception on the new band. In other words, the modified receiver may drift badly, especially when it is first turned on.
3. Receiving tubes which perform satisfactorily on 42-50 mc may have greatly reduced performance, or not work at all, on the new band.

One of the better FM receivers designed for operation on the old band is the General Electric Model JFM-90 translator. In spite of the above limitations, it may be the desire of some to rewind the oscillator and converter coils of this receiver so that it will tune the new band. Detailed instructions for making this conversion are given in an article on p29 of the May 1946 issue of FM and Television magazine. Instructions are quite complete, and include close-up photographs showing important features of the job.

It is suggested, if this change is made, that a tuning indicator be added to the receiver, since the oscillator will tend to drift more than before. A suitable indicator is a 200-0-22 microampere d-c instrument (zero center) connected in series with a high resistance between the ungrounded cathode of the 6H6 discriminator tube and the chassis. The series resistor should be selected to give about three quarters full scale maximum reading. This will be obtained as the station approaches. The instrument should read zero when tuned exactly on frequency. Shifting the tuning one way should cause a reading of one polarity, while shifting an equal amount in the other direction should produce a reading of equal magnitude but of opposite polarity.

Another method of adapting a receiver for operation on the new band is to add an adaptor unit, making the combined equipment into a double conversion superheterodyne receiver. Two adaptor designs are possible; in one the old receiver is tuned to a definite frequency, probably 42 mc, and the adaptor is tuned to receive signals on the new band. The other method, which makes possible a less expensive adaptor, has an oscillator on a fixed frequency, so that the tuning mechanism of the old receiver is used to tune the new band. With this method the old receiver will tune only an 8 or 9 mc portion of the new 20 mc wide band. If all local stations are within a 9 mc band the oscillator of the converter may be adjusted so the old receiver will tune all the stations available on the new band. If it is necessary to cover more of the new band, a switch must be added to the adaptor to permit the oscillator to operate on two or more frequencies. On each position of the switch, then, the old receiver will tune a portion of the new band.

A simple circuit of this type employing a 6J5 oscillator and a 1N34 fixed crystal as the converter is shown on page 31 of the Mat. 1946 Radio News. The Hallicrafters Company offers a kit, catalog CN-1, which includes a converter on this same principle. It employs a 7N7 dual triode as an oscillator and mixer, and a four position switch permits selecting ranges of 84-93 mc, 93-102 mc, and 102-111 mc. This unit is described on pages 214 and 270 of the April 1946 issue of Electronics magazine.



## A NOTE ON THE POWER RATINGS OF AUDIO AMPLIFIERS

by David W. Borst

When designing audio equipment for broadcast use, it is important to have reserve power available to handle peak levels without excessive distortion. A margin of 10 db has recently been accepted as an industry standard.

Translated into power levels, this requirement means that amplifiers for such purposes as feeding audio lines should be good for ten times their output as read on a VU meter without distortion. Tests at this ten-times level are conducted with a sine wave signal, of course. This same rule holds for power amplifiers, such as monitors.

In transmitter design, the requirement for reserve power means that the transmitter must be operated 10 db below 100 percent modulation under normal conditions so that peaks will not cause over-modulation. Conversely, at the ten-times normal power level, the transmitter should be modulated exactly 100 percent. The modulator is required to deliver, with no distortion, the power needed for 100 per cent modulation. For a plate modulated Class C RF stage the modulator audio power output should be one half the product of plate (plus screen) current in amperes and the plate voltage in volts.

When designing an amplifier to feed a telephone circuit the requirement is a minimum level on the telephone lines of plus 8 VU. This level must be read on a VU meter for anything but sine wave steady state conditions. Under these latter conditions plus 8 VU in a 600 ohm circuit is 0.006 watts. Applying the 10 db margin rule outlined above, the amplifier should be good for 0.06 watts.

If the amplifier is transformer coupled to the line, a 6 db isolating pad is desirable between the amplifier and the line. This pad insures that the load reflected on the plates of the output tubes is correct in

spite of the fact that the telephone line may not appear to be 600 ohms at all frequencies. To produce 0.06 watts in the line (peak) the amplifier must therefore produce 0.24 watts at no distortion. A 6SN7 in push-pull, or a pair of 6J5's, will produce this power at less than 0.5% rms harmonic distortion, provided a good output transformer is used.

(Continued from Page 18)

station policy is strict in minimizing "canned" material. Shows will be broadcast from 7:00 to 11:00 each night, and will include sports, news, Veteran's Corner, criticisms of radio, stage, and screen, special events, question and answer periods, forums, and a series on college life.

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